DOCUMENT RESUME

ED 470 064 HE 035 455

AUTHOR	Ehrenberg, Ronald G.; Smith, Christopher L.
TITLE	Within State Transactions from 2-Year to 4-Year Public Institutions.
PUB DATE	2002-02-05
NOTE	39p.; Support provided by the Andrew W. Mellon Foundation and the Atlantic Philanthropies (USA), Inc. through the Cornell Higher Education Research Institute (CHERI).
PUB TYPE	Reports - Research (143)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	Academic Achievement; *College Transfer Students; Higher Education; Least Squares Statistics; Probability; Program Effectiveness; *School Effectiveness; *Small Colleges; State Colleges; *Two Year Colleges
IDENTIFIERS	*State University of New York

ABSTRACT

This study developed and tested a method to determine how well each two-year institution in a state system is in preparing students for the successful completion of four-year college study and how successful each four-year institution is in graduating students from the two-year colleges that transfer to it. The study used data provided by the State University of New York (SUNY) to illustrate the methodological approach developed. The database represented 36 SUNY community colleges and colleges of technology and 19 four-year institutions. For expository purposes, the simplest statistical model, a system of linear probability equations was developed and estimated using ordinary least squares. Refinements could be added, but the model as developed illustrates the approach. Data are not reported for the institutions used in the analysis; the study is meant to illustrate the methodology, and as formative evaluation, not as a rating of the effectiveness of institutions. (Contains 8 tables and 22 references.) (SLD)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 470 064

Revised Draft
February 5, 2002

WITHIN STATE TRANSITIONS FROM 2-YEAR TO 4-YEAR PUBLIC INSTITUTIONS

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
R Ehrenberg
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

By

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Ronald G. Ehrenberg and Christopher L. Smith*

*Ehrenberg is the Irving M. Ives Professor of Industrial and Labor Relations and Economics at Cornell University and Director of the Cornell Higher Education Research Institute (CHERI). Smith is a junior at Cornell's School of Industrial and Labor Relations. We are grateful to the Andrew W. Mellon Foundation and the Atlantic Philanthropies (USA) Inc for supporting our research through their support of CHERI, to Assistant Provost Gary Blose from the State University of New York (SUNY) Office of Institutional Research for providing us with much of the data used in our paper, and to Gary Blose, Associate Provost John Porter of SUNY, Michael Matier, Director of Cornell's Office of Institutional Research and Planning and Professor Richard Romano from Broome Community College, for their comments on earlier drafts. However, all the opinions expressed herein are strictly our own.

fl2035455

BEST COPY AVAILABLE

I. Introduction

Public higher education institutions enroll about 80% of American college and university students. In the fall of 1996, 42% of freshmen enrolled in public institutions and 55% of full-time freshmen in public institutions began their study at two-year colleges. These proportions vary widely across states. However in a number of large states, including California, Florida, New Jersey and New York, two-year colleges provide the entry point to higher education for the majority of full-time first year students enrolled in public institutions (table 1).

We are likely to see a growing reliance on 2-year institutions in the years ahead to meet the growing demand for higher education opportunities that is occurring in many of our nation's states. Middle range projections are that between 1999 and 2011, college enrollments will rise by 20% with most of the growth in enrollment occurring in public higher education.[1] This growing demand for enrollments in public higher education is occurring at the same time that state budgets are becoming increasingly tight because of both the short-run financial impact of the recession that started in 2001 and of longer run factors, including the increased demand for state funding for other public needs, such as public elementary and secondary education, and the unwillingness of most states to consider raising state taxes.[2]

The likely growing importance of two-year colleges in the years ahead suggests that higher education researchers and policymakers should increase their attention to them.[3] Two-year colleges are as, or more, complex than their research university counterparts.

---

[1] See Gerald and Hussar (2001)
[2] See Ehrenberg (2000) for a more complete discussion of this point.
[3] Pascarella (1997) has also stressed the importance of researchers devoting more attention to two-year colleges and their students

Their missions include adult education, providing contract courses for companies and different levels of government, training students for careers, and preparing students for transfer to 4-year institutions.[4] Previous research by economists has addressed some of these missions and asked if there is an economic payoff to taking some 2-year college courses but not obtaining a degree, if the economic payoff to 2-year college courses is the same as that to 4-year college courses, if there is a "sheepskin" effect from receiving a 2-year degree and if the presence of 2-year public colleges in a state serves to increase or decrease overall educational attainment of young adults in the state.[5]

Our paper focuses on the last mission of the 2-year colleges, namely preparing students to transfer to 4-year institutions. The method by which public higher education is organized and governed varies widely across states and this might be expected to influence the flow of students from 2-year institutions into and through completion of 4-year institutions.[6] In some states, for example New York (in both the CUNY or SUNY systems) and Florida, 2-year and 4-year institutions are members of the same system. Florida also has a common course numbering system that should also facilitate transfers. In other states, for example Pennsylvania, some (but not all) of the 2-year public colleges are branch campuses of the flagship public university, which also should be expected to facilitate transfers. In still other states, for example Massachusetts, there are coordinating boards for all public (and sometimes also private) higher education institutions in a state, which in principle should also help to facilitate transfers. We know of no research that

---

[4] See Bailey (2002) for a more complete discussion of the multiplicity of roles that 2-year colleges play.
[5] See for example, Grubb (1993, 1995, 1997), Kane and Rouse (1995a, 1995b, 1999), Leigh and Gill (1997, forthcoming) and Rouse (1995, 1999). Higher education scholars also have studied issues relating to 2-year college students including their persistence in college and the effects that 2-year colleges have on their students. Examples and surveys of the literature include Pascarella and Terezini (1991), Pascarella (1999), Pascarella et. al. (1998) and Tinto (1993).
[6] Details of the governance relationships between 2-year and 4-year colleges, by state, are available from the Center for Community College Policy at its web page http://www.communitycollege.org.

4 BEST COPY AVAILABLE

has looked at the optimal way to organize public higher education in a state to facilitate transfers.

Within many large states there are multiple 2-year and 4-year institutions. In 1998-99, only 19 states had less than 15 public 2-year institutions. Of the 31 states with 15 or more public 2-year institutions, only 3 had 5 or fewer public 4-year institutions.[7] State policymakers and system administrators should want to know how well each 2-year public institution is doing in preparing those of its students who transfer to public 4-year institutions in the state to successfully complete 4-year college study. Similarly, they should want to know how successful each 4-year college in the state is in graduating those students from 2-year colleges that transfer to it. This information could then be used either in summative evaluations that relate to resource allocation decisions, or more preferably, in formative evaluations in which knowledge of the best practices of the most successful institutions are transmitted to their sister institutions in the state. That is, the information could be used to help improve the performance of a state's public higher education system.

Our paper uses data provided to us by the Office of Institutional Research of the State University of New York (SUNY) to illustrate a methodological approach that can be used to address these issues. While the methodology we develop is applied to data from the SUNY system, the paper's main purpose is to illustrate the methodology because we the approach can be usefully employed in any state that has multiple public 2-year and 4-year institutions

In the next section, we describe the SUNY system, discuss the data to which we have been granted access and sketch out our methodological approach. Empirical findings are

[7] U.S. Department of Education (2000), table 246

provided in the following three sections and the sensitivity of our finding to the specific model estimated and sample of data used are examined. Section VI presents a discussion of the some of the conceptual and statistical limitations of our approach and the types of data that, if available, would improve the analyses.

II. The Data and Our Methodology

The State University of New York (SUNY) system consists of 64 institutions. These include 4 university centers that confer baccalaureate, master's, doctoral and first professional degrees, 13 university colleges that offer baccalaureate and master's degrees, 5 specialized colleges that offer instruction in a variety of specialized areas and baccalaureate and higher level degrees, 2 stand alone health science centers, 5 statutory colleges that are located on the campuses of private universities (Alfred and Cornell) that offer the same range of degrees as the university centers, 30 2-year community colleges and 5 colleges of technology that offer 2-year degrees.[8]

During the past 15 years the proportion of the SUNY community college graduates that received Associate in Arts (AA) or Associate in Science (AS) degrees in a year that enrolled at a SUNY 4-year institution by the following fall has fluctuated between about .22 and .27.[9] Other AA or AS graduates enroll at a SUNY 4-year institution more than a year after completing their 2-year degrees, or transfer to private colleges and universities. Some SUNY 2-year college students enrolled in AA or AS programs transfer to SUNY 4-year institutions prior to receiving their degrees and some SUNY 2-year college students enrolled in other degree or certificate programs transfer to SUNY 4-year programs after,

[8] A listing of the institutions in each category appears in the appendix table.
[9] Office of Institutional Research and Analysis (2000), 263. The AA and AS are the 2-year degrees that are designed to prepare students for transfer to 4-year academic programs.

or before, receiving their degrees.[10] Finally some students transfer from private colleges or universities in New York State, or from colleges and universities in other states, to SUNY 4-year institutions.

As a result of all these student flows, transfer students are a substantial share of undergraduate students (new first year students plus transfer students) at all SUNY 4-year campuses. Table 2 presents data on transfer students as a share of all new undergraduate students in the fall of 1999 for each of the SUNY University Centers and University Colleges that illustrate this point. Transfer students' shares ranged from .201 at Geneseo to .743 at Empire State.[11] Most of the institutions had transfer shares between .3 and .5. Because transfer students make up such an important component of the enrollment at SUNY 4-year institutions, their progression through the system is of great concern to the university system.

We have been granted access to grouped data on the number of enrolled full-time students who transferred from each SUNY 2-year community college or college of technology to each SUNY 4-year university college, specialized college or university center at the start of the 1995 and 1996 fall semesters. The data are grouped in each case by the educational attainment of the students at the time of transfer. Specifically, we know whether the students in a group had received a 2-year degree at the time of transfer, or any other type of degree or certificate. We also have been given access to information on the number of students in each group who had completed a 4-year degree, were still

---

[10] For example, of the 8,937 students transferring from SUNY 2-year institutions to SUNY 4-year institutions in the fall of 1999, 3,247 had received AA or AS degrees, 1,249 had received Associate in Applied Science (AAS) or Associate in Occupational Studies (AOS) degrees, and 4,441 transferred prior to receiving any degree (Office of Institutional Research (2000), 219)

[11] Empire State College is a nontraditional higher education institution that provides innovative adult-focused degree programs to students throughout New York State and beyond. Many of its students started college immediately after graduation from high school, subsequently dropped out of those institutions, and return to enroll at Empire State as older students.

BEST COPY AVAILABLE

enrolled at the 4-year institution, or had dropped out of the 4-year institution by three years later (the falls of 1998 or 1999).[12]

Let P_{1jh} be the proportion of those individuals from 2-year college j who transferred to 4-year institution h in the fall of a year, who had received a 4-year degree by three years later. Let P_{2jh} and P_{3jh}, respectively, be the analogous proportions that were still enrolled in the 4-year institution in the fall three years later and that had dropped out by the fall three years later. Our approach initially is to estimate equations (1) below in which each proportion is specified to be a linear function of a vector of dichotomous variables d indicating from which 2-year college the students transferred (d_k equals one if the students came from 2-year college k and zero otherwise), a vector of dichotomous variables indicating to which 4-year institution the students transferred (e_r equals one if the students went to institution r and zero otherwise), three dichotomous variables (degt, dego and cert) indicating, respectively, whether the students in the group had each received a 2-year degree designed to prepare students for transfer to a 4-year academic program (an Associate in Arts (AA) or Associate in Science (AS) degree), another 2-year degree (an Associate in Applied Science (AAS) or Associate in Occupational Studies (AOS) degree), or a certificate of program completion prior to transferring (the omitted category is the receipt of no degree or certificate prior to transfer), the distance, in miles, between the 2-year college and the 4-year college and a dichotomous variable for the year in which the transfer occurred. In this model ε is a random error term and the a's, b's and c's are parameters to be estimated.

[12] There is no way to distinguish in the data between individuals who permanently drop out of college from individuals who have temporarily "stopped out" for academic or nonacademic reasons.

$$(1)\ P_{ijh} = c_0 + \Sigma a_k d_k + \Sigma b_r e_r + c_1 degt + c_2 dego + c_3 cert + c_4 dist_{jh} + c_5 year + \varepsilon_{ijh} \quad i=1,2,3$$

The equation for the proportion of a group that had graduated by the fall three years after transfer specifies that this proportion depends only on the 2-year college from which students in the group transferred, the 4-year institution to which students in the group transferred, whether students in the group had received a 2-year degree designed for students planning to transfer, another 2-year degree, or a certificate of program completion before transferring, the distance between the 2-year and 4-year institution and the year in which the transfer occurred. The equations for the proportions of each group that were still enrolled or had dropped out by the fall three years after transfer are analogously specified.

The distance variable is included because most 2-year college students live near the 2-year college at which they were enrolled and hence the distance measure is a measure of the distance between the students' homes and the 4-year college that they attended. Greater distances from home usually imply greater monetary or psychological costs of attending college and thus may lower the probability of graduating. The dichotomous variable for the year of transfer is included because labor market conditions vary over time and this may influence students' decisions about times to degree and/or dropout.[13]

To avoid collinearity problems, one of the d and one of the e must be excluded from the model. Somewhat arbitrarily, we choose 2-year college that we denote by TAJ to be the omitted 2-year institution and a 4-year institution that we denote by CS to be the

[13] For example, the average annual unemployment rate in New York State fell from 6.4% in 1997 to 5.2% in 1999.

omitted 4-year institution.[14] With these exclusions, the interpretation of the remaining a and b coefficients are straightforward. For example, the estimate of a_k in the proportion of students in the group who graduate by the fall three years after transfer equation is an estimate of how much higher or lower, the probability of a 2-year college transfer student's having graduated by the fall three years after transfer was if the student had been enrolled at 2-year college k, rather than at 2-year college TAJ, holding constant all of the other variables in the model (the student's degree status at transfer, the 4-year college to which the student transferred and the distance from the 2-year to the 4-year institution). Similarly, the estimate of b_r in the graduation equation is an estimate of how much higher or lower a student's probability of graduating by the fall three years after transfer was if he or she was enrolled at 4-year institution r, rather than at 4-year institution CS, holding all of the other variables in the model constant. The a and b coefficients in the proportions of students who are still enrolled in a 4-year SUNY institution and had dropped out of the 4-year SUNY institution by the fall three years after transfer can be similarly interpreted.

Put simply, subject to qualifications that we discuss later, estimation of equations (1) provide estimates of the relative effectiveness of each SUNY 2-year campuses in preparing those of their students who transfer to SUNY 4-year institutions with the backgrounds that they need to succeed at the SUNY 4-year institutions. Similarly, the equations provide estimates of the relative success of each SUNY 4-year institutions in retaining and graduating those SUNY 2-year transfer students that it enrolls.

---

[14] We emphasize that the choice of the excluded 2-year and 4-year institutions influences only the interpretation of the coefficients of the included dichotomous variables in the models, not the relative rankings of the institutions that we obtain below.

III. Initial Empirical Findings

There are 36 SUNY 2-year community colleges and colleges of technology and 19 SUNY 4-year institutions represented in the database to which we were granted access. Excluded from the database were the Health Science Centers, two of the Specialized Colleges (Maritime, Optometry), and the four Statutory Colleges at Cornell University. [15] Each 2-year college transferred students to some, but not necessarily all of the 19 4-year institutions, so there are less than 684 2-year college/4-year institution groups per year in the data. However, for each group, there were up to four subgroups consisting of students who had transferred from the 2-year to the 4-year institution with a 2-year degree designed to prepare them to transfer (AA, AS), students with another type of 2-year degree (AAS, AOS), students with a certificate of program completion, and students without any degree or certificate. When all the subgroups were taken into account, our sample consisted of 2107 grouped observations.

Equations (1) were estimated by ordinary least squares. The coefficients of the 2-year and 4-year institution dichotomous variables for each institution appear in tables 3 and 4, respectively. Also included in the model were the dichotomous variables for the degrees or certificates earned prior to transferring, the distance between the 2-year and 4-year institutions that the student attended and the year of transfer (fall 1995 or fall 1996).

Students that transferred with a 2-year "transfer" degree (AA or AS degree) already in hand not surprisingly had about a .20 higher probability of receiving their 4-year degree, a .07 lower probability of still being enrolled in the 4-year institution and a .13

[15] A list of the institutions in the sample is found in the appendix table. We also excluded Empire State College from our analyses because it offers flexible programs of individualized curriculum to primarily adult students and is not a residential college and the Institute of Technology at Utica-Rome because it was in the process of transitioning from an upper division undergraduate institution to a 4-year undergraduate program during the period.

lower probability of having dropped out of the 4-year institution by the fall three years later, than students who transferred before earning any degree or certificate of program completion, other variables held constant. Similarly transfer students that earned an AAS or AOS 2-year degree had about a .15 higher probability of receiving their 4-year degree within the three-year period, a .04 lower probability of still being enrolled, and a .11 lower probability of having dropped out of the 4-year institution, while transfer students that had some other degree or certificate of program completion prior to transferring had a .06 higher probability of graduating by the fall three years later, a .06 higher probability of still being enrolled in school and a .12 lower probability of dropping out by the fall three years later, all relative to students who transferred before receiving any degree or certificate of program completion, other variables held constant. The distance variable proved to be statistically significantly different from zero only in the still enrolled equation with larger distances appearing to enhance the probability of still being enrolled. Finally, the dichotomous variable for the fall 1996 entry cohort was negative in the drop out equation, indicating that students who transferred in the fall of 1996 were less likely to have dropped out three years later than students who transferred in the fall of 1995. This may reflect the declining unemployment rate in New York State during the late 1990s, which may have facilitated part-time employment for students that needed to work to help finance their educations.

Table 3 shows the estimated impact on the probabilities, as of the fall three years after transferring, of having graduated from a SUNY 4-year institution, of still being enrolled in the SUNY 4-year institution and of having dropped out of the SUNY 4-year institution for transfer students to each 4-year institution in the SUNY system, as compared to the

probabilities for transfer students to 4-year institution CS. The identities of the institutions in the sample are masked in the table by agreement with the Office of Institutional Research at SUNY because the purpose of our paper is to illustrate the methodology, not to draw normative conclusions about the success of any specific 4-year SUNY institution in educating transfer students. As a result, the university centers, the 4-year university colleges, the statutory colleges and the specialized 4-year colleges in the sample have been randomly assigned the codes CA to CS.

The findings in table 3 are quite striking. Attendance at 9 of the institutions – CA, CC, CD, CF, CJ, CL, CO, CP and CQ –was associated with about a .10 to .45 statistically significantly lower probability of graduating by the fall of three years after transfer, than if the students had transferred to CS. In each of these cases transfer students also had a higher probability of dropping out by the fall three years after transfer than did students who transferred to UD. In 3 of these cases – CD, CF and CQ– attendance at the institution was associated, other factors held constant, with a higher probability of still being enrolled in the fall three years after transfer than if the student had attended CS.

Transfer students who attended CF had by far the lowest adjusted probability of graduating by the fall three years after graduation, other factors in the model held constant. Their probability of graduating by the fall three years after transfer was over .44 lower than transfer students who had enrolled at CS. While this was partially due to their having a .34 higher probability of still being enrolled, transfer students to CF also had over a .12 higher probability of dropping out by the fall three years after transfer than did transfer students to CS.

CR also had a higher transfer student drop out rate within three years after transfer than CS did; this was associated primarily with a lower probability of still being enrolled, not with a lower graduation probability.

Only two of the SUNY 4-year institutions appeared to perform better than CS. Transfer students who attended CB or the CG had higher statistically significantly higher probabilities of graduating by the third year after transfer. However, transfer students to CG also had a slightly higher probability of having dropped out by the fall of the third year after transfer.

Taken at face value, the results in table 3 suggest that by the falls of 1998 and 1999 some 4-year SUNY campuses had graduated a greater proportion of the 2-year SUNY transfer students who transferred to them in the falls of 1995 and 1996 respectively, than did other 4-year SUNY campuses. While part of the difference was due to the differing speed at which transfer students progressed through their programs at the different 4-year campuses, part was due to differences in transfer student dropout rates within 3 years of enrollment at the different 4-year campuses. System officials and policy makers should be interested in learning why these differences exist.

The coefficients in table 4 similarly show the estimated impact on the probabilities of having graduated from a SUNY 4-year institution by the fall three years after transfer, of still being enrolled in a SUNY 4-year institution and of having dropped out of the 4-year institution, of having transferred from each 2-year college of technology and each community college in the SUNY system, all as compared to having transferred from TAJ. Again the institutions' identities have been masked and each college of technology and community college has been randomly assigned an institutional code.

Many of the estimated coefficients are statistically insignificantly different from zero, which means that one cannot distinguish the impacts of having transferred from the corresponding institutions from those from having transferred from TAJ. However, a number of statistically significant coefficients did occur.

In particular the probability of graduating by the fall of 1998 appears to be about .100 to .200 lower for transfer students from TF, TG, TH, TK, TL, TP, TW, TAF and TAH. In the case of TK and TAF, the lower graduation probability was associated with a higher drop out probability. In contrast, for TG, TL, TW and TAH the lower graduation probability was associated with a higher probability of still being enrolled. If measured over a longer time period, the probabilities of graduation for transfer students from these schools would not necessarily be lower than that for transfer students from TAJ. Finally, transfer students from TAE appeared to have a higher probability of graduating from the 4-year SUNY institutions within three years of transfer and a lower probability of still being enrolled, other factors held constant, than did transfer students from TAJ.

If one takes our results at face value, policy makers and system administrators should want to know why transfer students from the different 2-year SUNY institutions appear to have different probabilities of completing their 4-year degrees and of dropping out within three years after transfer. They might ask what policies have the institutions whose former students have the best graduation record pursued and then disseminate information about these policies to the other 2-year institutions in the SUNY system. Similarly, system administrators and policymakers should want to know why transfer students to different 4-year institutions have different graduation rate probabilities within

three years and seek to disseminate information about what the best performing 4-year institutions are doing to the other 4-year institutions.

IV. Controlling for Heterogeneity in the Preparation of Transfer Students

The analyses presented above make use of a sample that consists of full-time transfer students who graduated from 2-year degree programs designed to prepare them to transfer to 4-year academic programs (AA and AS degrees), who graduated from other 2-year programs (AAS and AOS degrees), who received certificates of program completion or who transferred before receiving any degree or certificate. Dichotomous variables for which degree or certificate of program completion that a transfer student received were included as explanatory variables in the model to control for a student's academic preparation prior to enrolling in the 4-year institution.

A weakness of this approach is that students without AA or AS degrees who transfer to 4-year institutions may substantially differ in the number of credits that they are able to transfer towards the 4-year degree. If systematically students in this category from one 2-year college have earned fewer credits that apply towards their 4-year degrees than students in this category from a second 2-year college, it would be reasonable to expect that students from the first 2-year college would take longer to complete their 4-year college program. However, our observing this result would be no reflection on the performance of the first 2-year college, relative to the second, in preparing students for transfer to 4-year colleges. Rather, it simply would reflect that students in the category from the first college transferred with fewer applicable credits towards their 4-year degrees than comparable students from the second college.

Similarly, if transfer students from 2-year colleges in this category who transfer to one 4-year institution systematically have earned fewer credits that are applicable to their degrees than transfer students from 2-year colleges in this category who transfer to a second 4-year institution, it would be reasonable to expect that transfer students in this category would, on average, take longer to receive their 4-year degree at the first 4-year institution than at the second 4-year institution. However, our observing this result would be no reflection on the performance of the first 4-year institution relative to the second 4-year institution in educating this category of transfer students. It simply would reflect systematic differences in the academic preparation of transfer students to each of the two 4-year institutions.

One way to control for this problem is to include information on the number of credits towards the 4-year degree that each student in our sample received at the time of enrollment in our estimating equations. If such information were available in a state university system's information system, we would encourage researchers to use it. However, in the absence of the availability of such data, a simpler approach is simply to eliminate from the sample all of the individuals who transferred without receiving a 2-year college degree specifically designed to prepare them for transfer to 4-year colleges and to reestimate the models. We did the latter and the results are presented in tables 5 and 6. We must caution that when we did this the number of grouped observations in the sample declined from 2107 to 762. Smaller sample sizes make it harder to "tease out" statistically significant findings in the data.

A comparison of the coefficients found in table 3 to those found in table 5 and of the coefficients found in table 4 to those found in table 6 at first glance appear to suggest that

limiting the sample to transfer students who are graduates of AA and AS degree programs leads to some differences in findings. For example, turning first to the results for the 4-year institutions, the number of 4-year institutions whose fall 1995 and 1996 transfer students were estimated to have had a statistically significant lower probability of graduating by the fall three years later than transfer students to CS drops from 9 to 4. Similarly, the number that have statistically significantly higher drop out probabilities than CS fall from 13 to 8.

Also, when we turn to the results for the 2-year institutions, the number of institutions whose transfer students appear to have a statistically significant lower probability of graduating within three years than transfer students from TAJ decreases from 8 to 1. While previously transfer students from only one institution, TAE, were judged to have a statistically significantly higher graduation probability than transfer students from TAJ, other factors held constant, when the restricted sample was used TAE was joined by TA and TB in having higher estimated graduation probabilities.

Do these results imply that it is important to control for heterogeneity in the types of students transferring from the different 2-year institutions in analyses of these types and that failure to do so may affect the conclusions of studies reached? Lest the reader conclude that our methodology is very sensitive to the sample of transfer students included in the analyses, we should emphasize that the comparisons above consider only those estimated institutional coefficients that were statistically significantly different from zero at at least the .10 level of significance. If instead we consider the point estimates of each institution's coefficients, without worrying about the coefficients' statistical significance, a measure of how similar each coefficient estimate in table 3 is to

the corresponding coefficient in table 5 (and similarly for the coefficients in tables 4 and 6) can be obtained from the Spearman rank correlation coefficient of the corresponding coefficient estimates.

The Spearman rank correlation coefficient of the estimated 4-year institutional coefficients found in tables 3 and 5 for the probability of graduating by the fall three years after transfer is .7897. This means that the ranking of which 4-year institutions are most successful in graduating transfer students from 2-year colleges is actually very similar in the two samples. Similarly, the corresponding Spearman rank correlation coefficients for the probabilities of being enrolled in college and having dropped out of college by the fall three years after transfer are .8620 and .7517, respectively, which again means that the ranking of SUNY 4-year institutions on each of these two measures are also very similar across the two samples. All of the values of these Spearman correlation coefficients are statistically significantly different from zero at at least the .05 level, which means that we can reject the hypothesis that each of the rankings of the 4-year colleges on these measures is not similar across the two samples.

When we similarly compute the Spearman rank correlation coefficient for the estimated 2-year institutional coefficients found in tables 4 and 6 for the probability of graduating by the fall three years after transfer, it proves to be .7096. . The comparable Spearman rank correlation coefficients for the probability of still being enrolled in college three years after transfer is .6403. With 34 observations (2-year institutions) each of these correlations is statistically significantly different from zero at the .05 level of significance, which means that we can reject the hypotheses that the ranking of 2-year institutions on these measures is not similar across the two samples. In contrast, the

Spearman rank correlation coefficient of the probability of having dropped out of college by the fall three years after transfer is only .2411, which is not statistically significantly different from zero at even the .10 level. This means the ranking of 2-year institutions in terms of their students' drop out probabilities is not similar between samples.

Interestingly, however, the correlation in each of the samples between a 2-year institution's rank on its transfer students' graduation probability and its rank on their drop out probability is close to zero. In contrast, its rank on their graduation probability within three years after transfer is highly negatively correlated with its rank on their still being enrolled in college within three years after transfer probability. Differences across 2-year SUNY institutions in the probability that students from them who have transferred to SUNY 4-year institutions graduate within 3 years reflect primarily the speed that they are progressing towards a degree, not differences in drop out behavior. As such, the fact the ranking of 2-year institutions on the drop out probabilities is not similar across samples is of little consequence.

V. Controlling for Student Quality

Graduation probabilities vary widely across the 4-year SUNY campuses present in our sample for students who first enroll at each campus as a freshman. For example, the 6-year graduation rates for the class entering as freshman in the fall of 1992 varied from 29.68 to 82.22. Presumably these probabilities vary because of differences in the academic quality and preparation of students admitted to and enrolling at each institution, differences in the financial situations of enrolled students at each institution and differences in the academic support that students receive from faculty and staff at each institution. In fact the correlation across the SUNY 4-year institutions of the 6-year

graduation rates for freshman in the fall of 1992 and the estimated institutional dichotomous variables in our probability of completion equations is about .70. So our estimates of the relative impact of the 4-year colleges in graduating 2-year college transfer students to a large extent may reflects their success in graduating students who enter initially as freshman.

Similarly, our model implicitly assumes that transfer students from a given SUNY 2-year institution that enroll in different SUNY 4-year institutions are all roughly comparable in academic preparation and quality. So, for example, if there are two SUNY 4-year campuses that are located near a given SUNY 2-year campus, it assumes that students from the 2-year campus that transfer to each of the 4-year campuses are comparable in academic quality. However, if the admissions standards for freshman students, in terms of students' academic records and test scores, at the first 4-year campus are higher than the admission standards at the second 4-year campus, it is reasonable to assume that the entrance standards for transfer students to the first campus will also be higher than the admission standards for transfer students to the second. If differences in admission standards for transfer students at SUNY 4-year campus mirror differences in standards for freshmen at the SUNY 4-year campuses, the estimated coefficients of the transfer student three year graduation rate, continued enrollment rate and drop out rate probabilities that we report in tables 3 and 5 may simply reflect differences in the academic preparation and ability of the transfer students at different 4-year institutions, not differences in the academic support that students receive from faculty and staff at different 4-year institutions.

In an ideal world, one would have information on the academic backgrounds of the students who transfer from each 2-year to each 4-year college in terms of things like grade point averages, fraction of courses for which transfer courses were granted and test scores. In the absence of such data, an alternative approach to measuring the relative effectiveness of a 4-year SUNY institution in graduating transfer students is the extent to which their transfer students' graduation rate exceeds the graduation rate of transfer students at other 4-year SUNY institutions, after one controls for each institution's 6-year freshman graduation rate in the estimation. Implicitly this approach assumes that the admissions standards for transfer students at each 4-year institution parallel the admission standards for freshman students at the institution. That is, it assumes that those institutions that have the highest admission standards for freshman also, in a relative sense, have the highest admission standards for transfer students.

To obtain such estimates, we reestimated our models for the sample of transfer students that received AA or AS degrees before transferring, entering into each equation as an additional explanatory variable the 6 year graduation rate of students who entered as freshman at each 4-year institution. Data for freshman who entered in the fall of 1992 and 1993 were used for the fall 1995 and fall 1996 transfer students, respectively.

The coefficients of the 4-year and 2-year college obtained from this estimation appear in tables 7 and 8 respectively. The ranking of the 4-year institutions that one obtains when this is done is quite different than the ranking that is one obtains from tables 3 and 5. For example, while transfer students who enrolled at CC, CJ and CO all were estimated to have lower probabilities of graduating within 3 years than transfer students who enrolled at CS in tables 3 and 5, in this specification they all have higher

probabilities of graduating within 3 years. Indeed, the Spearman rank correlation coefficient of the 4-year institution graduation probabilities is -.2230, which is not statistically significantly different from zero. This result suggests that it is important to control for student preparation and background in any attempt to evaluate the relative performance of 4-year institutions within a state system in educating transfer students.

However, inclusion in the model of the 6-year graduation rate for freshmen at each 4-year institution does not alter the pattern of coefficients of the 2-year college variables. For example, the results in table 8 suggest that, other factors held constant, transfer students from TA, TX and TAE each had a higher probability of graduating within three years and those from TI a lower probability of graduating within three years, than did transfer students from TAJ.[16] This is exactly the same pattern of findings that appeared in table 6 when we did not control for the 6-year graduation rate of the 4-year institution to which students transferred. Indeed, when we compute the Spearman rank correlation coefficients across the 2-year institutions of the graduation probabilities, the still enrolled probabilities and the drop out probabilities in the two tables, they are .997, .999, and .999, respectively. This result was expected because the 6-year graduation rates of freshmen at the 4-year colleges are uncorrelated with the 2-year college dichotomous variables.

Interestingly, once we control for the 6-year graduation rate of freshmen, the ranking of the 4-year institutions on the probability that transfer students to them graduate within 3 years is highly positively correlated with the share of an institution's new students that are transfer students (the data in table 2). Put another way, on average,

[16] Each of these results is statistically significantly different from zero at at least the .10 level of significance.

the more important that transfer students are to a SUNY 4-year institution, the greater the likelihood that they will graduate within 3 years.

VI Concluding Remarks

Our goal in this paper has been to describe a methodology that can be used within any state system of higher education to evaluate how well each 4-year public institution is performing in educating students who transfer to it from each 2-year public institution in the state and how well each 2-year public institution is performing in preparing its students who transfer to 4-year public institutions in the state to complete their programs at the 4-year institutions. The estimates that we have obtained for the SUNY system in New York State are meant only to illustrate the methodology and we have masked the identities of the institutions for this reason. Our view is that rankings of this type are best thought of as formative rather than summative. Rather than using them to reward, or penalize, institutions, it would be more productive, at least in the initial years that they are employed, for system administrators and policy makers to try to learn what the factors are that cause some 4-year and 2-year institutions to "look better" on these measures than do other institutions within the system. Once the factors are discovered, dissemination of information about the actions taken by the "better institutions" that led to their success to all institutions in the system would be beneficial.

There are of course a number of ways in which our methodology can be improved. For expository purposes we have used the simplest statistical model, a system of linear probability equations, and estimated it using ordinary least squares. Inasmuch as the sample sizes vary across the cells of the model (2-year college/4-year college/degree at transfer), more precise estimates could be obtained using the method of weighted

regression. In addition, the linear probability model does not take into account that each of the probabilities can vary only between 0 and 1 and that there is an explicit ordering of the probabilities (graduating is better than still being enrolled, which in turn is better than having dropping out). Using a multinomial logit model takes the first into account, while using either an ordered probit or logit model takes the second into account.[17] We have in fact estimated both multinomial logit and ordered logit models and the results we obtained when these models were employed were very similar to those that we have reported in the text.[18]

The data that we use follows transfer student for only 3 years. If access to follow-ups that span longer periods of time were available in a state system's information system, it would be possible to gain a better understanding of whether institutions vary in their longer-run graduation and drop out probabilities.

Evaluations of this type would ideally also be conducted using more cohorts (entering classes) of transfer students. The small number of students found in many of the 2-year institution/4-year institution cells makes it difficult for our models to "tease out" statistically significant differences across institutions. The increases in sample sizes permitted by access to multiple cohorts of data would enhance the likelihood of being able to observe differences across institutions. Use of multiple cohorts would also be

---

[17] See Jeffrey M. Woolridge (2002), pages 504 to 508, for a discussion of ordered probit and ordered logit models.

[18] Results of these estimations are available from the authors on request. To give the reader an idea of how similar they are to the results presented in the text, the spearman rank correlation of the coefficients of the 4-year institution dichotomous variables reported for the graduation rate equation in table 3 with the coefficients of the 4-year institution dichotomous variables in the graduation rate equation that we obtained using the same sample from the multinomial logit model is .970. The analogous rank correlations for the samples and models used in tables 5 and 7 were .976 and .941, respectively. Similarly, the analogous rank correlations for the coefficients of the 2-year institution dichotomous variables in the graduation rate equations reported in table 4, 6 and 8, with the coefficients of the 2-year institution dichotomous variables obtained from the graduation rate equations when the multinomial logit models were estimated were .829, .748 and .782, respectively.

preferred because an institution's "performance" could be judged on average over a number of cohorts rather than from how the students in only one or two cohorts do.

Rather than assuming, as we have done in tables 7 and 8, that the admission standards and preparation of transfer students to each 4-year institution can be controlled for by the 6-year graduation rate of students who initially enroll as freshmen at the institution, it would be preferable to try to directly control for these variables. If data on the academic backgrounds and information on each transfer student are not easily available in a state system's information system, information on the minimum grade point average, or the average grade point average, for transfers, that each 4-year institution has admitted in each year would be useful.

As in many states, there is no system wide articulation agreement in New York State that specifies the conditions under which students from a 2-year institution can transfer to a 4-year institution. The success of transfer students coming from a SUNY 2-year campus that transfer to a SUNY 4-year campus may depend upon the types of articulation agreements, if any, that exist between the two campuses. Such agreements often specify sets of required courses for transfer students wishing to major in certain fields that must be accomplished before transfer, along with grade point averages that must be maintained in these courses; transfer students may be better prepared for transfer if such agreements are in place. Having detailed data on the nature of articulation agreements between each 2-year campus and each 4-year campus within a state system, whether each agreement is adhered to and the resources that each institutions applies to advising potential transfer students from or to it would improve the analyses and aid in the interpretation of the estimated institutional coefficients.

A final factor that may influence the ability of 2-year college transfers to progress towards 4-year degrees is the financial background of the transfer students. If transfers from one 2-year institution have greater "financial need" than transfers from a second 2-year institution, it would not be surprising to find that the former have a lower probability of receiving a 4-year degree and a higher probability of dropping out within three years after transfer than do the latter. Similarly, if transfer students to one 4-year institution have greater "financial need" than transfer students to a second 4-year institution, it would not be surprising to observe that the former similarly have a lower probability of receiving a 4-year degree and a higher probability of dropping out within three years of transfer than to the latter. However, neither of these differences would reflect on the 2-year colleges from the students came or the 4-year colleges to which they transferred. If data in state system information systems permitted one to control for transfer students' financial backgrounds, this would improve the analyses of this type.

References

Thomas Bailey, "Community Colleges in the 21st Century: Challenges and Opportunities" in P.A Gram and N. Stacey eds. *The Knowledge Economy and Postsecondary Education: Report of Workshop* (Washington DC: National Academy Press, 2002)

Ronald G. Ehrenberg, "Financial Forecasts for the Next Decade", *The Presidency,* Spring 2000

Debra Gerald and William J Hussar, *Projections of Educational Statistics to 2011* (Washington DC: National Center for Education Statistics, 2001)

W. Norton Grubb, "The Varied Economic Returns to Postsecondary Education: New Evidence From the Class of 1972", *Journal of Human Resources* 28 (Spring 1993): 365-392

W. Norton Grubb, "The Varied Economic Returns to Postsecondary Education: New Evidence From the Class of 1972: Response", *Journal of Human Resources* 30 (Winter 1995): 222-228.

W. Norton Grubb, "The Returns to Education in the Sub-Baccalaureate Labor Market, 1984-1990", *Economics of Education Review* 16 (June 1997): 231-245

Thomas J. Kane and Cecelia E. Rouse, "Labor Market Returns to Two- and Four-Year College", *American Economic Review* 85 (June 1995): 600-614 (1995a)

Thomas J. Kane and Cecilia E. Rouse, "The Varied Economic Returns to Postsecondary Education: New Evidence from the Class of 1972: Comment", *Journal of Human Resources* 30 (Winter 1995): 205-221 (1995b)

Thomas J. Kane and Cecilia E. Rouse, "The Community College: Educating Students at the Margin Between College and Work", *Journal of Economic Perspectives* 13 (Winter 1999): 63-84

Duane E. Leigh and Andrew M. Gill, "Labor Market Returns to Community Colleges: Evidence for Returning Adults", *Journal of Human Resources* 32 (Spring 1997): 334-353

Duane E. Leigh and Andrew M. Gill, "Do Community Colleges Really Divert Students from Earning Bachelor's Degrees", *Economics of Education Review* (forthcoming)

Office of Institutional Research and Analysis, State University of New York, *Application and Enrollment Patterns of Transfer Students, Fall 1999* (Albany, December 2000)

Office of the Provost and Vice Chancellor for Academic Affairs, State University of New York, "High School Graduation Status of Full-Time First-Year Students", *Statistical Release No. 395* (November 21, 2000)

Ernest T. Pascarella, "Its Time We Started Paying Attention to Community College Students", *About Campus* 1 (January/February 1997): 14-17.

Ernst T. Pascarella, "New Studies Track Community College Effects on Students", *Community College Journal* 69 (July 1999): 8-14.

Ernst T. Pascarella and Patrick T. Terezini, *How College Affects Students: Findings and Insights From Twenty Years of Research* (San Francisco CA: Jossey-Bass Publishers, 1991)

Ernst T. Pascarella, Marcia Edison, Amaury Nora, Patrick T. Terezini and Linda Sema Hagedon, "Does Community College Versus Four-Year College Attendance Influence Student Educational Plans", *Journal of College Student Development* 39 (March/April 1998): 179-195

Cecilia E. Rouse, "Democratization or Diversion? The Effects of Community Colleges on Educational Attainment", *Journal of Business Economics and Statistics* 13 (April 1995): 217-224

Cecilia E. Rouse, "Do Two-Year Colleges Increase Overall Educational Attainment? Evidence From the States", *Journal of Policy Analysis and Management* 17 (December 1998): 595-620

Vincent Tinto, *Leaving College: Rethinking the Causes and Cures of Student Attrition*, 2nd. Edition (Chicago IL: University of Chicago Press, 1993)

U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics* (Washington DC: 2000)

Jeffrey M. Woolridge, *Econometric Analysis of Cross Section and Panel Data* (Cambridge MA: MIT Press, 2002)

Table 1

Share of Freshmen Enrolled in Public Institutions in the Fall of 1996 Who Were Enrolled in 2-Year Colleges

	All	FT	State	All	FT
Alabama	.56	.50	Montana	.11	.09
Alaska	.01	.01	Nebraska	.42	.34
Arizona	.19	.16	Nevada	.57	.26
Arkansas	.64	.49	New Hampshire	.27	.20
California	.78	.60	New Jersey	.62	.55
Colorado	.45	.27	New Mexico	.29	.28
Connecticut	.50	.31	New York	.58	.55
Delaware	.35	.22	North Carolina	.44	.34
Florida	.65	.52	North Dakota	.27	.27
Georgia	.48	.37	Ohio	.36	.26
Hawaii	.74	.60	Oklahoma	.48	.36
Idaho	.36	.34	Oregon	.59	.45
Illinois	.72	.56	Pennsylvania	.55	.43
Indiana	.23	.15	Rhode Island	.49	.37
Iowa	.71	.59	South Carolina	.50	.41
Kansas	.54	.42	South Dakota	.01	.01
Kentucky	.30	.27	Tennessee	.45	.39
Louisiana	.16	.12	Texas	.59	.45
Maine	.27	.25	Utah	.59	.48
Maryland	.59	.44	Vermont	.25	.15
Massachusetts	.56	.45	Virginia	.32	.23
Michigan	.46	.30	Washington	.82	.72
Minnesota	.47	.43	West Virginia	.15	.11
Mississippi	.65	.61	Wisconsin	.48	.36
Missouri	.36	.26	Wyoming	.71	.66
U.S Total	**.55**	**.42**			

Source: Authors' calculations from data contained in the WEBCASPAR System (All- all freshmen, FT- full time freshmen)

Table 2

Transfer Students As A Share of All New Undergraduate Students in the Fall 1999 at SUNY 4-Year University Centers and University Colleges

Albany	.375	Geneseo	. 201
Binghamton	.271	New Paltz	.401
Buffalo Univ.	.339	Old Westbury	.533
Stony Brook	.431	Oneota	.352
Brockport	.479	Oswego	.359
Buffalo Coll.	.484	Plattsburgh	.442
Cortland	.368	Potsdam	.320
Empire State	.743	Purchase	.291
Fredonia	.277		

Source: Authors' computations from data found in *Application and Enrollment Patterns of Transfer Students – Fall 1999*, Report Number 6-00A, Office of Institutional Research and Analysis, State University of New York, December 2000, part VII.

Table 3

Receiving institutions (impact relative to CS)	(A) Graduated by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(B) Are still enrolled in the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(C) Have dropped out by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
CA	-0.096	-2.48	0.034	0.90	0.060	2.33
CB	0.114	2.50	-0.138	-3.11	0.025	0.84
CC	-0.177	-4.37	0.037	0.93	0.139	5.16
CD	-0.265	-4.70	0.170	3.07	0.093	2.49
CE	0.035	0.91	-0.074	-1.94	0.036	1.38
CF	-0.443	-9.25	0.335	7.14	0.107	3.35
CG	0.107	2.46	-0.168	-3.94	0.057	1.98
CI	-0.029	-0.66	-0.075	-1.76	0.101	3.50
CJ	-0.169	-4.36	0.045	1.19	0.121	4.70
CK	-0.029	-0.72	-0.096	-2.44	0.129	4.86
CL	-0.160	-3.74	0.043	1.03	0.120	4.23
CM	0.111	1.08	-0.045	-0.45	-0.069	-1.01
CN	-0.043	-1.05	-0.048	-1.21	0.091	3.35
CO	-0.104	-2.64	-0.002	-0.05	0.104	3.97
CP	-0.163	-3.61	-0.002	-0.05	0.166	5.54
CQ	-0.175	-3.86	0.092	2.07	0.081	2.71
CR	0.013	0.33	-0.078	-1.98	0.062	2.34

* Also included in the model were dichotomous variables for whether the student in the group had received an AA/AS ('transfer') degree, AAS/AOS ('non-transfer') degree, or an "other" degree before transferring, a year indicator variable (whether the 95/98 or 96/99 cohort), and the distance between the sending and receiving institutions (in miles).

n=2107 groups

Summary Statistics	Mean	Standard Dev
Fraction graduated	0.520	0.367
Fraction still enrolled	0.364	0.345
Fraction dropped out	0.117	0.231
Observations: 2107		

Table 4

Sending institutions (impact relative to TAJ)	(A) Graduated by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(B) Are still enrolled in the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(C) Have dropped out by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
TA	0.087	1.57	-0.095	-1.76	0.007	0.18
TB	0.050	0.79	-0.094	-1.52	0.042	1.00
TC	-0.004	-0.07	-0.044	-0.85	0.046	1.31
TD	-0.029	-0.53	0.016	0.30	0.011	0.31
TE	-0.018	-0.28	0.009	0.15	0.007	0.17
TF	-0.107	-1.91	0.052	0.95	0.054	1.47
TG	-0.160	-2.44	0.135	2.10	0.023	0.53
TH	-0.094	-1.68	0.062	1.12	0.031	0.84
TI	-0.092	-1.57	0.082	1.42	0.010	0.26
TJ	0.006	0.10	-0.023	-0.38	0.025	0.62
TK	-0.126	-1.90	0.012	0.19	0.112	2.53
TL	-0.097	-1.76	0.083	1.54	0.014	0.39
TM	-0.042	-0.77	0.003	0.07	0.039	1.10
TN	0.001	0.01	0.029	0.51	-0.030	-0.77
TO	0.074	1.38	-0.091	-1.72	0.015	0.43
TP	-0.139	-2.25	0.073	1.21	0.064	1.56
TQ	-0.119	-1.50	-0.021	-0.27	0.138	2.63
TR	0.002	0.04	-0.027	-0.54	0.024	0.70
TS	-0.067	-1.07	0.018	0.29	0.048	1.15
TT	-0.051	-0.86	0.053	0.91	-0.004	-0.10
TU	-0.079	-1.37	-0.013	-0.23	0.092	2.38
TV	-0.095	-1.58	0.021	0.36	0.075	1.86
TW	-0.155	-2.31	0.115	1.75	0.037	0.83
TX	0.042	0.70	-0.094	-1.61	0.051	1.29
TY	-0.053	-0.96	0.011	0.20	0.056	1.53
TZ	-0.081	-1.33	0.046	0.77	0.033	0.83
TAA	-0.017	-0.33	-0.015	-0.29	0.035	1.02
TAB	0.051	0.90	-0.081	-1.48	0.030	0.81
TAC	-0.062	-1.22	-0.008	-0.15	0.069	2.03
TAD	0.044	0.76	-0.066	-1.18	0.026	0.69
TAE	0.117	2.12	-0.151	-2.80	0.033	0.91
TAF	-0.146	-2.52	0.044	0.78	0.100	2.59
TAG	-0.064	-1.15	0.028	0.52	0.034	0.94
TAH	-0.191	-2.37	0.216	2.73	-0.028	-0.51
TAI	-0.020	-0.37	-0.013	-0.25	0.035	0.96

n=2107 groups

Table 5

Receiving institutions (impact relative to CS)	(A) Graduated by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(B) Are still enrolled in the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(C) Have dropped out by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
CA	-0.076	-1.23	0.025	0.41	0.051	1.72
CB	0.078	0.89	-0.109	-1.29	0.032	0.77
CC	-0.060	-0.92	-0.030	-0.47	0.094	3.02
CD	-0.338	-2.84	0.291	2.52	0.044	0.78
CE	0.132	2.05	-0.163	-2.60	0.030	0.98
CF	-0.342	-4.49	0.273	3.69	0.070	1.92
CG	0.147	2.26	-0.166	-2.63	0.019	0.62
CI	-0.003	-0.04	-0.039	-0.58	0.042	1.28
CJ	-0.026	-0.42	0.005	0.08	0.020	0.70
CK	0.021	0.33	-0.113	-1.84	0.093	3.09
CL	-0.129	-1.88	0.075	1.12	0.070	2.15
CM	-0.194	-1.14	0.208	1.26	-0.013	-0.16
CN	0.018	0.27	-0.068	-1.05	0.055	1.72
CO	-0.043	-0.68	-0.052	-0.84	0.096	3.14
CP	-0.052	-0.80	-0.043	-0.68	0.100	3.20
CQ	-0.154	-2.17	0.119	1.73	0.035	1.04
CR	0.044	0.71	-0.081	-1.35	0.037	1.23

* Also included in the model were a year indicator variable (whether the 95/98 or 96/99 cohort), and the distance between the sending and receiving institutions (in miles).

n=762 groups

Summary Statistics	Mean	Standard Dev
Fraction graduated	0.615	0.339
Fraction still enrolled	0.324	0.328
Fraction dropped out	0.063	0.156
Observations: 762		

Table 6

Sending institutions (impact relative to TAJ)	(A) Graduated by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(B) Are still enrolled in the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(C) Have dropped out by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
TA	0.161	1.83	-0.131	-1.54	-0.034	-0.80
TB	0.159	1.70	-0.153	-1.68	-0.012	-0.26
TC	0.007	0.08	-0.084	-0.99	0.072	1.73
TD	0.060	0.69	-0.051	-0.60	-0.014	-0.35
TE	-0.107	-1.01	0.105	1.02	-0.002	-0.05
TF	0.031	0.33	-0.035	-0.38	0.004	0.08
TG	-0.086	-0.89	0.034	0.36	0.048	1.03
TH	-0.122	-1.39	0.125	1.46	-0.009	-0.21
TI	*	*	*	*	*	*
TJ	0.138	1.49	-0.141	-1.56	0.020	0.46
TK	-0.045	-0.41	-0.131	-1.24	0.169	3.27
TL	0.068	0.77	-0.032	-0.38	-0.037	-0.86
TM	-0.011	-0.12	0.018	0.20	-0.013	-0.30
TN	-0.011	-0.12	0.044	0.51	-0.036	-0.86
TO	0.044	0.50	-0.063	-0.73	0.014	0.32
TP	0.006	0.06	0.050	0.49	-0.061	-1.21
TQ	-0.284	-2.84	0.221	2.27	0.059	1.24
TR	0.022	0.25	-0.073	-0.87	0.047	1.13
TS	-0.019	-0.19	-0.044	-0.46	0.059	1.25
TT	-0.094	-1.04	0.063	0.71	0.026	0.61
TU	0.001	0.01	-0.002	-0.02	0.000	-0.01
TV	-0.059	-0.62	0.077	0.83	-0.023	-0.51
TW	-0.042	-0.41	0.046	0.45	-0.009	-0.19
TX	0.158	1.73	-0.156	-1.75	-0.008	-0.18
TY	-0.036	-0.40	0.034	0.39	-0.003	-0.07
TZ	0.032	0.35	-0.011	-0.12	-0.025	-0.56
TAA	-0.031	-0.36	0.010	0.12	0.030	0.72
TAB	0.022	0.23	-0.030	-0.31	0.002	0.05
TAC	-0.013	-0.15	-0.036	-0.45	0.046	1.15
TAD	0.039	0.44	-0.028	-0.32	-0.016	-0.39
TAE	0.166	1.92	-0.158	-1.88	-0.011	-0.27
TAF	-0.108	-1.07	0.053	0.54	0.049	1.01
TAG	-0.057	-0.58	0.109	1.15	-0.056	-1.21
TAH	-0.176	-1.35	0.211	1.67	-0.041	-0.66
TAI	-0.042	-0.48	0.041	0.49	0.002	0.05

n=762 groups

*TI had no transfers with a transfer degree in the 95/98 cohort

Table 7

Receiving institutions (impact relative to CS)	(A) Graduated by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(B) Are still enrolled in the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(C) Have dropped out by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
CA	0.253	1.94	-0.246	-1.93	-0.005	-0.07
CB	-0.056	-0.56	0.000	0.00	0.055	1.15
CC	0.411	2.32	-0.417	-2.42	0.015	0.18
CD	0.430	1.46	-0.340	-1.19	-0.085	-0.60
CE	0.251	3.28	-0.261	-3.50	0.010	0.28
CF	0.111	0.63	-0.099	-0.58	-0.007	-0.08
CG	-0.127	-1.10	0.058	0.52	0.065	1.18
CI	0.006	0.08	-0.046	-0.69	0.041	1.23
CJ	0.199	2.00	-0.179	-1.85	-0.017	-0.36
CK	0.158	2.00	-0.225	-2.93	0.070	1.85
CL	0.075	0.76	-0.093	-0.96	0.036	0.76
CM	-0.195	-1.16	0.209	1.27	-0.013	-0.16
CN	0.325	2.57	-0.321	-2.60	0.003	0.05
CO	0.270	2.13	-0.309	-2.51	0.043	0.70
CP	0.124	1.39	-0.188	-2.15	0.071	1.63
CQ	0.077	0.72	-0.071	-0.68	-0.004	-0.07
CR	-0.326	-2.27	0.223	1.59	0.099	1.43

* Also included in the model were the 6-year graduation rate for the originating institution, a year indicator variable (whether the 95/98 or 96/99 cohort), and the distance between the sending and receiving institutions (in miles).

n=762 groups

Summary Statistics	Mean	Standard Dev
Fraction graduated	0.615	0.339
Fraction still enrolled	0.324	0.328
Fraction dropped out	0.063	0.156
Observations: 762		

Table 8

Sending institutions (impact relative to TAJ)	(A) Graduated by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(B) Are still enrolled in the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)		(C) Have dropped out by the fall of 1998 (from '95 cohort) or in fall 1999 (from '96 cohort)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
TA	0.158	1.81	-0.129	-1.52	-0.033	-0.79
TB	0.156	1.67	-0.150	-1.65	-0.011	-0.25
TC	0.004	0.05	-0.082	-0.97	0.072	1.74
TD	0.060	0.70	-0.051	-0.61	-0.014	-0.35
TE	-0.110	-1.04	0.107	1.04	-0.002	-0.04
TF	0.033	0.35	-0.036	-0.40	0.003	0.08
TG	-0.083	-0.86	0.031	0.33	0.047	1.02
TH	-0.118	-1.35	0.122	1.43	-0.009	-0.22
TI	*	*	*	*	*	*
TJ	0.147	1.59	-0.148	-1.65	0.019	0.42
TK	-0.035	-0.32	-0.139	-1.33	0.168	3.23
TL	0.062	0.71	-0.028	-0.32	-0.036	-0.84
TM	-0.014	-0.16	0.020	0.23	-0.012	-0.29
TN	-0.009	-0.10	0.042	0.49	-0.037	-0.87
TO	0.046	0.52	-0.064	-0.74	0.014	0.32
TP	0.008	0.08	0.049	0.48	-0.061	-1.21
TQ	-0.286	-2.87	0.222	2.29	0.060	1.24
TR	0.019	0.23	-0.071	-0.85	0.047	1.14
TS	-0.015	-0.16	-0.046	-0.49	0.058	1.24
TT	-0.099	-1.10	0.067	0.76	0.027	0.63
TU	-0.005	-0.06	0.003	0.03	0.001	0.02
TV	-0.056	-0.59	0.074	0.81	-0.024	-0.52
TW	-0.037	-0.36	0.042	0.42	-0.010	-0.20
TX	0.154	1.68	-0.153	-1.72	-0.007	-0.16
TY	-0.034	-0.38	0.033	0.37	-0.003	-0.08
TZ	0.029	0.32	-0.009	-0.10	-0.024	-0.55
TAA	-0.034	-0.40	0.013	0.15	0.030	0.74
TAB	0.022	0.22	-0.029	-0.31	0.003	0.05
TAC	-0.012	-0.15	-0.037	-0.45	0.046	1.15
TAD	0.036	0.41	-0.026	-0.30	-0.016	-0.38
TAE	0.164	1.92	-0.157	-1.88	-0.011	-0.26
TAF	-0.117	-1.16	0.060	0.62	0.050	1.04
TAG	-0.058	-0.60	0.110	1.17	-0.056	-1.20
TAH	-0.177	-1.37	0.212	1.68	-0.041	-0.66
TAI	-0.042	-0.49	0.042	0.49	0.002	0.05

n=762 groups

*TI had no transfers with a transfer degree in the 95/98 or 96/99 cohort

Appendix Table

The State University of New York (SUNY) System (Fall 2001)

I. University Centers (4) - Albany, Binghamton, Buffalo, Stony Brook

II. University Colleges (13) - Brockport, Buffalo State, Cortland, Empire State College, Fredonia, Geneseo, New Paltz, Old Westbury, Oneota, Oswego, Plattsburgh, Potsdam, Purchase

III. Specialized Colleges (5) – College of Technology at Farmingdale[b], Maritime College[a], College of Optometry[a], Institute of Technology at Utica-Rome[c], College of Environmental Science and Forestry

IV. Statutory Colleges (5) – College of Ceramics at Alfred and the Colleges of Agriculture and Life Sciences[a], Human Ecology[a], Veterinary Medicine[a] and the School of Industrial and Labor Relations[a] at Cornell

V. Community Colleges (30) – Adirondack, Broome, Cayuga County, Clinton, Columbia-Greene, Corning, Dutchess, Erie, Fashion Institute of Technology, Finger Lakes, Fulton Montgomery, Genessee, Herkimer County, Hudson Valley, Jamestown, Jefferson, Mohawk Valley, Monroe, Nassau, Niagara County, North Country, Onondaga, Orange County, Rockland, Schenectady County, Suffolk County, Sullivan County, Tompkins Cortland, Ulster County, Westchester

VI. Colleges of Technology (5) – Alfred, Canton, Cobleskill, Delhi, Morrisville

VII. Health Science Centers (2) – Brooklyn[a] and Syracuse[a]

[a] Not included in the sample
[b] Became a 4-year institution after 1995 and included as a 2-year college in the sample
[c] Enrolled only upper-division students in 1995 and 1996 and was not included in the sample

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: "Within State Transitions From 2-Year to 4-Year Public Institutions"	
Author(s): Ronald Ehrenberg	
Corporate Source: CHERI	Publication Date: 2002

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1

☐

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A

☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B

☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Signature: Ronald G. Ehrenberg	Printed Name/Position/Title: Ronald G. Ehrenberg, Director	
Organization/Address: CHERI Cornell University Ithaca, NY 14853	Telephone: 607-255-3026	FAX: 607-255-4496
	E-Mail Address: rge2@cornell.edu	Date: 3/31/03

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
4483-A Forbes Boulevard
Lanham, Maryland 20706

Telephone: 301-552-4200
Toll Free: 800-799-3742
FAX: 301-552-4700
e-mail: info@ericfac.piccard.csc.com
WWW: http://ericfacility.org